

The computations of the quantities themselves being effected by means of algebraical equations of great complexity, and of numerical calculations of considerable length, which afford in themselves no ready means of verifying their accuracy, the author has been under the necessity of examining closely every line of figures before he proceeded to another. Upon the whole he is certain that there is no error of importance in the numbers he obtained; and that the only probable source of error is the inevitable rejection of figures beyond a certain place of decimals.

In concluding this investigation, the most laborious, probably, that has yet been made in the planetary theory, he remarks that the term in question is a striking instance of the importance to which terms, apparently the most insignificant, may sometimes rise. As an illustration of the magnitude of the errors which might under other circumstances have arisen from the neglect of this term, he further observes, that if the perihelion of Venus and the earth had opposite longitudes, and if the line of nodes coincided with the major axis, the eccentricities and inclination having the same values as at present, the coefficient of the inequality in the epoch would be $8''.9$, and all the other terms would be important. A very small increase of the eccentricities and inclination would double or treble these inequalities.

Anniversary Meeting, Nov. 30.

HIS ROYAL HIGHNESS THE DUKE OF SUSSEX, K.G.,
President, in the Chair.

The President delivered the following Address:—

Gentlemen,

The period, provided by our Statutes, has again come round, when your Officers and Council must be reconstituted by your authority; and I feel myself called upon, in conformity with the custom which has been sanctioned by my predecessors, to address you upon such subjects connected with the Royal Society and its administration, as the events of the last year may have rendered proper to be noticed by me. But before I touch upon other topics, I feel anxious to say a few words upon my own position in the Society, and my views respecting it.

The Chair of the Royal Society has been filled by a rare succession of illustrious men, and I feel proud that I have been judged worthy, upon any grounds, to occupy a situation which has become dignified by its association with the names of those who have conferred so much honour upon our country. It is indeed true that I can enter into no competition with such predecessors, as respects scientific knowledge, which my early education, my public occupations, and even the duties of my rank, have prevented me from cul-

tivating and attaining to that extent I could have wished: but I should do no honour to your kindness, which has placed me in this high and dignified station, if I should profess that I considered myself wholly inadequate to the efficient discharge of many at least of its public duties, or that I felt my occupation of this Chair was likely to prove injurious either to the credit of the Society, or to the advancement of science. If such, indeed, Gentlemen, were my own persuasion, I would not continue to fill this honourable post for another hour.

The ostensible duties, in fact, of your President, are chiefly ministerial: he is your organ to ask and to receive your decisions upon the various questions which are submitted to you; and he is your public voice to announce them. Though he presides at the meetings of your Council, he possesses but one voice among many; incurring an equal responsibility in common with every one of its members. He is your official representative in the administration of the affairs of the British Museum: he presides in your name, by virtue of your election of him, at the Board of Visitors of the Royal Observatory, as appointed by His Majesty's Warrant: he is your medium of communication with public bodies, and with the members of the Government upon the various subjects important to the interests of science, which are either submitted to your consideration, or which are recommended by you, through your Council, for the consideration of others. For many of those functions I feel myself to be somewhat prepared by my habits of life, as well as by my public occupations: and for some of them more especially, if I may be permitted to say so, by that very rank in which Providence has placed me as a member of the Royal Family of this country; for though it would be most repugnant to my principles and my wishes that the weight of my station should in any way influence the success of an application which it was either improper to ask or inexpedient to grant, I should feel it to be equally due to the dignity of this Society and to my own, that the expression of your opinions and of your wishes should experience both the respect and the prompt attention to which it is so justly entitled.

But while I should consider it my duty to exert the just authority of an English Prince in the assertion of your rights, and in the promotion of the success of those objects which you may intrust to my advocacy without these walls, yet within them I trust that I never have made, and that I never shall make use of it, either for the promotion of party purposes, or for the suppression of the candid, free and unbiassed expression of your opinions. In this Chair I appear as the Official Head of a Society comprising a great majority of the most distinguished men in science and in literature within the Three Kingdoms, and in this character alone I wish to be recognised; and it is my most anxious desire to witness around me the free expression and interchange of opinions, subject to no restraints but such as are requisite for the regularity and well government of every numerous and mixed society.

I do not think it necessary, Gentlemen, to apologize to you for thus enlarging upon topics, which, though personal in some respect to myself, cannot be altogether destitute of interest to you ; inasmuch as it undoubtedly concerns you to understand distinctly the principles by which I have regulated my conduct hitherto whilst filling this Chair, and to which I shall continue to adhere in case I should be honoured by being re-elected to it. And I am the more anxious that they should be generally known, in consequence of some circumstances which attended my election last year. If any angry or uneasy feelings were called forth upon that occasion, I can assure you that I do not, nor ever did, partake in them ; and it would be a source of the most heartfelt pride to me if I could witness their entire extinction in a cordial cooperation amongst all our members to promote the advancement of science and the common honour of our country ; to fulfil, in short, the solemn obligation imposed upon us individually and collectively by our charter, to promote the good of the Royal Society, established for the advancement of natural knowledge, and to pursue the ends for which it was originally founded.

Having ventured to say thus much upon a subject of some delicacy, though in no respect painful to myself, I trust that I may be permitted to add a few words more upon another topic which is nearly connected with it, and which is to express my respect for the accomplished philosopher to whom I had the honour, I will not say misfortune, to find myself opposed last year. His name has been familiar to me from my earliest years, for it is that of one whom my Royal Father delighted to patronize, and which is inscribed in imperishable characters upon the great monuments of the universe, the knowledge of which he contributed so greatly to extend. I knew that venerable man when full of years and of honour, and I can well conceive the feelings of placid triumph and pride with which he must have contemplated the rising promise of his son. What the maturer fruits of that early promise have been, it is not necessary for me to state when addressing the members of this Society : it is sufficient to say, that there is no one among the most illustrious men of England whom the concurrent voice of his countrymen would have pointed out as more worthy of the distinguished and peculiar mark of royal favour and approbation which he has so recently received than Sir John Herschel. Towards such a man I can entertain no feelings but those of admiration, respect and goodwill, and which I trust, if fed by a more intimate acquaintance, will ultimately lead to those of sincere friendship.

The labours of your Council during the past year have been more than commonly important, and have been directed to objects which deeply concern the welfare, good government and general utility of our establishment. For the particulars of those labours I must refer you to the Report which has been so ably drawn up by one of your Secretaries, Dr. Roget, and which will be read to you by him at the conclusion of this Address. I trust, however, that in one particular

I may be excused if I trespass upon the province of that Report ; if with the natural partiality of an affectionate brother and a loyal subject, I venture to record the gracious expressions of His Majesty when he inscribed his Royal Name in our Charter-book as the Patron of the Royal Society, in the presence of the Council. His Majesty then declared his gracious intention of continuing the same protection to this Society which had been extended to it by his royal predecessors ; that His Majesty had learnt from the professional pursuits of his early life to estimate the immense benefits which science had conferred upon this country in particular, and upon the world in general, by perfecting the art of navigation ; that it had produced similar effects upon all the arts of life, however apparently remote from the source from which they flowed ; that the progress of civilization amongst nations was generally coextensive with the improvements in science and the extent of its practical application ; and that His Majesty should feel it to be his duty, as the Sovereign of these Kingdoms, to aid by his encouragement the exertions of the Royal Society to fulfil the great objects of its foundation. His Majesty concluded by recommending us in strong terms to cultivate friendly relations with the great scientific establishments of other countries, with a view to the free and liberal interchange of knowledge and discoveries. And here allow me, Gentlemen, to pause for a moment, with a view to remark that our Gracious Sovereign, in giving us this wholesome admonition relative to foreign scientific bodies, meant in a most delicate and dignified way, silently to convey to us his royal and paternal pleasure and advice as to the harmony and friendly intercourse which he wished us to maintain with all our national institutions, and more particularly amongst ourselves. Such sentiments, Gentlemen, are worthy of a King of England : and permit me further to observe, that it affords me additional pride and satisfaction that circumstances should have combined together so fortunately as to have made me the organ of such gracious communications between our Royal Patron and the Royal Society.

The Council, upon the same occasion, had the honour of presenting, in the name of the Society, a dutiful and loyal Address to Her Majesty the Queen, who most condescendingly received them, and most graciously declared her intention of extending her support and protection to the Royal Society.

The list of Fellows whom the Society has lost during the last year is more extensive than usual, and the time will not allow me more than to take a brief and passing notice of some of them, whose labours have brought them into a more immediate connection with this Society and the great objects which it proposes to pursue.

Mr. Abernethy was one of those pupils of John Hunter who appears the most completely to have caught the bold and philosophical spirit of investigation of his great master. He was the author of various works and memoirs upon physiological and anatomical or surgical subjects, including three papers, which have appeared in our Transactions. Few persons have contributed more abundantly

to the establishment of the true principles of surgical or medical practice in those cases which require that minute criticism of the symptoms of disease, upon the proper knowledge and study of which the perfection of medical art must mainly depend. As a lecturer he was not less distinguished than as an author; and he appears to have possessed the art of fixing strongly the attention of his hearers, not less by the just authority of his opinions, than by his ready command of apt and forcible illustrations. He enjoyed during many years of his life a more than ordinary share of public favour in the practice of his profession; and though not a little remarkable for the eccentricities of his manners and an affected roughness in his intercourse with his ordinary patients, he was generally kind and courteous in those cases which required the full exercise of his skill and knowledge, and also liberal in the extreme when the infliction of poverty and privation was superadded to those of disease.

Captain Henry Foster was a member of the profession which, under all circumstances, is so justly celebrated for activity and enterprise, and which, when wanting the stimulus of war, has on many occasions lately distinguished itself by the zealous and successful cultivation of those studies and the practice of those observations which are so essentially connected with the improvement of navigation. He accompanied Captain Basil Hall, in the *Conway*, in his well-known voyage to South America, and assisted him materially in his pendulum and other observations. He afterwards joined Captain Parry in the second of his celebrated voyages; and at Port Bowen and other stations within the Arctic Circle, he made, with the assistance of Captain Parry and others, a most valuable and extensive series of observations upon the diurnal variation, diurnal intensity and dip of the magnetic needle, and upon other subjects connected with terrestrial magnetism and astronomical refractions, which formed an entire fourth part of our *Transactions* for 1826, and was printed at the especial expense of the Board of Longitude. For these papers he received the Copley Medal; and the Lords of the Admiralty acknowledged their sense of the honour which was thus conferred upon the profession to which he belonged, by immediately raising him to the rank of Commander, and by appointing him to the command of the *Chanticleer* upon a voyage of discovery and observation in the South Seas. It was during the latter part of this voyage that he perished by an unfortunate accident; but I am happy to say that the public is not likely to lose altogether the benefit of his labours, and that he has left behind him an immense mass of observations of various kinds, which the Lords of the Admiralty have confided partly to this Society, and partly to the Astronomical Society, with a view to their publication in such a form as may best serve the interests of science, and may most tend to establish the character and fame of their lamented author.

The Reverend Fearon Fallows was a distinguished cotemporary of Sir John Herschel at Cambridge, and throughout his life an ardent cultivator of astronomical science. In the year 1821 he was

appointed Astronomer Royal at the Cape of Good Hope, to which place he immediately proceeded, though provided only with a small transit and an altitude and azimuth instrument, a clock, and a few other absolutely necessary appendages of an observatory. In the course of the two following years he completed a catalogue of 273 southern stars, which was published in our Transactions for 1824. The delays which subsequently took place in the building of the observatory, which was not completed before 1828, and the want of those capital instruments which were required to put it into complete operation, although they did not interrupt or check either the industry of his research or the accuracy of his observations, yet by making them necessarily imperfect, deprived them of a very considerable part of their value.

When the mural circle at last arrived, and when he at length imagined himself in possession of the means of effecting the great object of his ambition, by making the catalogues of the stars of the southern hemisphere rival, in accuracy and completeness, those of the northern, he found new difficulties meeting him in the derangements occasioned in so large an instrument, by embarking, disembarking, and fixing it, thus producing errors which were nearly irremediable in the absence of the original maker, or of any superior artist. In the midst of these harassing discouragements he was attacked by severe illness, and at the same time deprived of his assistant by a similar cause, yet even under these afflictions he continued true to his duty; and in a letter to one of his friends a short time before his death, he describes himself as being carried daily in a blanket by his servants from his sick room to the observatory for the purpose of winding up his clocks and chronometers. His disease at last assumed the form of an incurable dropsy, and he died a short time before his intended embarkation for England, whither at last he had reluctantly consented to return, when his recovery at the Cape was pronounced to be hopeless.

In the course of the year 1829 he made, in conjunction with Captain Ronald and Mr. Johnstone, a very complete series of pendulum observations, which were published in our Transactions for the year 1830: and the Lords of the Admiralty are in possession of a very extensive series of astronomical observations made during the last seven years of his life, which it is to be hoped that, before long, they will cause to be given to the public.

Lieutenant Colonel Macdonald, son of the celebrated Flora Macdonald, besides many professional and other works, was also the author of two papers in our Transactions for the years 1796 and 1798, containing observations upon the diurnal variation and dip of the magnetic needle made at Fort Marlborough in Sumatra, accompanied likewise by some observations upon their causes.

Mr. Thomas Greatorex, the well-known musician, was the author of a paper on the measurement of the heights of mountains. He was a person of great modesty and simplicity of character, and possessed a knowledge of some branches of mathematics and of natural

philosophy which is rarely met with in the members of his profession.

Sir Thomas Frankland, as long ago as the year 1795, was the author of a short paper in our Transactions on the welding of cast steel and iron.

Mr. Wm. Strutt of Derby was the author of those great improvements in the construction of stoves, and in the economical generation and distribution of heat, which have of late years been so extensively and so usefully introduced in the warming and ventilation of hospitals and public buildings. He possessed a very great knowledge of practical mechanics, and employed himself through the whole course of a very active life in the furtherance of objects of public utility.

Dr. Parkinson, Archdeacon of Leicester, gained the highest honours at Cambridge, and was the author of a treatise on mechanics. In his early life he was employed, in conjunction with Israel Lyons and others, in the formation of the tables requisite to be used with the Nautical Almanac.

Dr. Sims was a very zealous cultivator of botanical science, and continued for many years the publication of Curtis's Botanical Magazine.

Dr. Ferris, besides other professional publications, was the author of a work entitled "A General View of the establishment of Physic as a Science in England."

The Rev. William Holwell Carr was a gentleman of refined and cultivated taste, and a liberal patron of the fine arts; he has established no slight claim upon the gratitude of his country by the bequest of his collection of exquisite pictures to the British Museum, whose Council have thought it most adviseable, for their better preservation and security, as well as for the furtherance of that gentleman's views in making such a magnificent present to the nation, to deposit them in the British Gallery.

The Earl of Darnley was a liberal patron of the Fine Arts, and a zealous friend of all useful public institutions: and he gave a most convincing proof of the interest which he felt in the promotion of natural knowledge, by the formation and maintenance of a noble collection of rare and curious plants and animals.

Mr. Thomas Hope, the justly celebrated author of *Anastasis*, and Dr. Magee, Archbishop of Dublin, author of the great work upon the Atonement, are names not likely to be soon forgotten in the literary history of this country; but they require no further notice from me, as their labours are altogether foreign to the pursuits of this Society.

The only Foreign Member whose death we have to record is the celebrated Sömmerring, who died lately at Frankfort, his native city, full of years and honour. His numerous and most splendid anatomical works, particularly those on the different organs of sense, have long placed him at the head of the anatomists of Germany, and probably of Europe.

I cannot conclude this Address, Gentlemen, without again requesting you to accept my assurances of the sense which I entertain of the high honour of presiding over this Society, and of my determination to promote its interests to the utmost of my power and ability, in case it should be your pleasure to confide them again to my keeping, by electing me a second time to fill this Chair.

Report of the Council to the Anniversary Meeting on St. Andrew's Day, 1831.

The Council, to whom the Society has confided the management of its affairs during the past year, in giving an account of the manner in which they have endeavoured to discharge that trust, have in the first place to congratulate the Society upon the honour which has been conferred upon them by His present Majesty's having been graciously pleased to become the Patron of the Society, and by his having expressed a warm interest in its prosperity.

They wish, in the next place, to call the attention of the Society to the alterations they have made in the Statutes. It has for some time past appeared desirable that the Statutes should undergo a thorough revision with a view to their improvement and adaptation to the present state of the Society. The Council, anxious to accomplish this important object in the most effective manner with respect to the permanent interests of the Society, solicited the assistance of such of the Fellows as seemed to be most able, as well as willing, to give them the benefit of their valuable advice and co-operation in the performance of this difficult task. Three members of their own body having, on this occasion, intimated their inability to attend, from the pressure of other avocations, and their wish, in consequence, to retire from the Council, the Society was called upon to supply the vacancies occasioned by these resignations. The number of the Council being completed by these new elections, twenty-one other Fellows (a number equal to their own) were selected from the Society, for the purpose of composing with the Council a Committee of forty-two members for preparing the requisite emendations in the Statutes, and also for inquiring whether it might be advisable to propose any alterations in the existing Charter of the Society.

This Committee held several meetings for the discussion of these subjects. It was found upon investigation, that several improvements which were suggested could not be effected consistently with the powers granted by the present Charter: and it was finally agreed that the advantages to be expected from those changes would be more than compensated by the difficulties and expenses that would attend the procuring of a new Charter. The Committee, therefore, proceeded to direct their attention to the effecting of such emendations of the Statutes as were compatible with the powers granted by the Charter, and which appeared to afford ample means for the introduction of much improvement. Many of the Statutes which, in the course of time, had become no longer con-